

CLAIMS

What is claimed is:

1. A semiconductor structure (1), comprising:
  - 5 a isolation region (5) formed above a semiconductor material (10); and a pillar (15) formed of the semiconductor material under the isolation region, where the pillar is capped with a first dielectric material (20) to form a void (16).
    - 10 2. The semiconductor structure of claim 1, further comprising an electrical component (25) formed over the isolation region.
    - 15 3. The semiconductor structure of claim 2, wherein the electrical component comprises a passive device or bonding pad.
    - 20 4. The semiconductor structure of claim 1, wherein the semiconductor material comprises monocrystalline silicon.
    5. The semiconductor structure of claim 1, wherein the pillar is coated with a second dielectric material (21).
    - 25 6. The semiconductor structure of claim 5, wherein the second dielectric material comprises thermally grown oxide or silicon nitride.
    - 30 7. The semiconductor structure of claim 1, wherein the first dielectric material comprises deposited silicon dioxide.
    8. The semiconductor structure of claim 1, wherein the void (16) extends (17) at least five micrometers into the

semiconductor material.

9. A method of making a semiconductor structure (1), comprising the steps of:

5 forming a pillar (15) of semiconductor material 10 under a isolation region of a semiconductor substrate 5 ; and

capping the pillar with a first dielectric material (20) to form a void (16).

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10. The method of claim 9, wherein the step of forming a pillar further comprises the steps of:

removing semiconductor material from the semiconductor substrate to form a cavity (18);

15 thermally oxidizing sidewalls (19) of the cavity to form a layer of silicon dioxide (22,23,26); and

etching the layer of silicon dioxide leaving a pillar (15) of the semiconductor material.

20 11. The method of claim 10, wherein the step of thermally oxidizing comprises the step of consuming a portion (22) of the semiconductor material.

25 12. The method of claim 9, wherein the first dielectric material comprises deposited silicon dioxide.

13. The method of claim 9, wherein the semiconductor material comprises silicon.

30 14. The method of claim 9, further comprising the step of forming a passive component or bonding pad (25) over the isolation region.

15. A semiconductor device (1), comprising:  
an electrical component (25); and

5       a semiconductor substrate (10) having a isolation  
region (5) for forming the electrical component, where the  
isolation region includes a silicon pillar (15) extending  
into the semiconductor substrate.

10 16. The semiconductor device of claim 15, wherein the  
isolation region includes a cap layer (20) (12) formed on  
the silicon pillar.

15 17. The semiconductor device of claim 16, wherein the cap  
layer forms a void (16) .

18. The semiconductor device of claim 16 wherein the silicon  
pillar extends at least five micrometers into (17) the  
semiconductor substrate.

20 19. The semiconductor device of claim 16 wherein the cap  
layer is comprised of deposited silicon dioxide or silicon  
nitride.

25 20. The semiconductor device of claim 15, wherein the  
electrical component is formed over the isolation region.

21. The semiconductor device of claim 20, wherein the  
electrical component comprises a passive device or bonding  
30 pad of the semiconductor device.

22. The semiconductor device of claim 15, wherein the  
isolation region is formed with silicon dioxide.

23. A method of making a semiconductor device (1), comprising the steps of:

5 forming silicon pillar (15, 27) under a isolation region (5) of a semiconductor substrate (10) wherein the silicon pillar is capped with a first dielectric material (20) to form a void (16); and

10 forming an electrical component (25) on the isolation region.

24. The semiconductor device of claim 23, wherein the first dielectric material comprises deposited silicon dioxide or silicon nitride.

15 25. The semiconductor device of claim 23, wherein the electrical component comprises a passive device or bonding pad.

20 26. The semiconductor device of claim 23, wherein the isolation region is formed with silicon dioxide.

27. A semiconductor structure (1), comprising:

a semiconductor substrate (10) having a recessed region  
25 formed with a pillar; and  
a dielectric material disposed over the recessed region and capping the pillar to form a void between the pillar and a sidewall of the recessed region.

30 28. The semiconductor device of claim 27, wherein the pillar is formed with a semiconductor material.

29. A method of making a semiconductor structure,  
comprising the steps of:

5        oxidizing sidewalls of cavities in a semiconductor  
material to form a continuous oxide layer between adjacent  
cavities; and

      etching the continuous oxide layer to leave a pillar of  
the semiconductor material.

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30. The method of claim 29, wherein the cavities are formed  
in a region of the semiconductor material, further  
comprising the step of depositing a dielectric material over  
the region to form a void adjacent to the pillar.

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